IN THE CLAIMS:

1. (currently amended) An in-line particulate detector comprising:

a housing having an inner flow portion in flow communication with a fluid inlet and a fluid outlet, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer;

a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion;

a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode;

a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode such that a baseline level of an unimpeded generated light beam is detected by said second photodiode;

circuitry coupled to said first and second photodiodes to monitor the ratio of light intensities measured by said first and second photodiode to indicate the presence of particulate within an introduced fuel flow; and

a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities.

2. (original) An in-line particulate detector in accordance with Claim 1, wherein said flow is natural gas.

3. (currently amended) An in-line particulate detector in accordance with Claim 1, wherein said flow is selected from the group consisting of propane, hexane, ~~heptone~~ heptane, gas derived from coal, and methane.

4. (previously presented) An in-line particulate detector in accordance with Claim 1, wherein a fuel containing particulates will cause a generated light beam to be scattered, and the light intensity measured by second photodiode will increase above the baseline level and the light intensity reaching first photodiode will decrease.

5. (canceled).

6. (previously presented) An in-line particulate detector in accordance with Claim 1, wherein said control structure is inputted into said circuitry by programming into memory of an application specific integrated circuit.

7. (previously presented) An in-line particulate detector in accordance with Claim 1, wherein said control structure is inputted into said circuitry by being embedded in the form of algorithms in one or more computers.

8. (original) An in-line particulate detector in accordance with Claim 7, wherein said computer is selected from the group consisting of a workstation, a minicomputer, a microcomputer, and a supercomputer.

9. (original) An in-line particulate detector in accordance with Claim 1, wherein said control structure is programmed in a language selected from the group of C, C++, Basic, MATLAB, and FORTRAN.

10-14. (canceled)

15. (currently amended) An in-line particulate detector comprising:

a housing having an inner flow portion in flow communication with a fluid inlet and a fluid outlet, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer;

a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion;

a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode;

a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode such that a baseline level of an unimpeded generated light beam is detected by said second photodiode;

circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced fuel flow;

a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities; and

at least one remote unit for transmitting signals generated from said first and second photodiodes;

a central station; and

a communications link.

16. (previously presented) A remote in-line particulate detector in accordance with Claim 15, wherein said signals represent light intensities measured by said first and second photodetectors.

17. (original) A remote in-line particulate detector in accordance with Claim 15, wherein said remote system comprises a central interface coupled to said at least one remote unit, wherein said central interface is adapted to control communications between said central station and said at least one remote unit.

18. (original) A remote in-line particulate detector in accordance with Claim 15, wherein said communications link comprises a radio frequency (RF) front end.

19. (original) A remote in-line particulate detector in accordance with Claim 15 wherein said communication link comprises a satellite.

20. (original) A remote in-line particulate detector in accordance with Claim 15, wherein said communication link comprises a link.

21. (original) A remote in-line particulate detector in accordance with Claim 15 wherein said remote system further comprises an antenna.

22. (original) A remote in-line particulate detector in accordance with Claim 15 wherein said remote system further comprises at least one user interface device.

23. (currently amended) An in-line particulate detector comprising:

a housing having an inner flow portion in flow communication with a fluid inlet and a fluid outlet, which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer;

a means for emitting a light beam within said inner flow portion;

a first means for detecting substantially full strength of an unimpeded light beam generated by said means for emitting;

a second means offset from a normal unimpeded path between said light emitting means and said first means for detecting a baseline level of unimpeded light beam generated by said means for emitting;

a means for comparing the light intensities detected by said first and second means for detecting, to determine the presence of particulate within an introduced flow; and

a control means for receiving from said comparing means a signal to initiate a system control based on the ratio of light intensities.

24. (original) An in-line particulate detector in accordance with Claim 23, wherein said flow is natural gas.

25. (original) An in-line particulate detector in accordance with Claim 23, wherein said flow is selected from the group consisting of propane, hexane, heptane, gas derived from coal, and methane.

26. (original) An in-line particulate detector in accordance with Claim 23, wherein a fuel containing particulates will cause a generated light beam to be scattered, and the light intensity measured by said second means for detecting will increase above the baseline level and the light intensity reaching said first means for detecting will decrease.

27. (original) An in-line particulate detector in accordance with Claim 23, wherein a control structure is inputted into said circuitry.

28. (original) An in-line particulate detector in accordance with Claim 27, wherein said control structure is inputted into said circuitry by programming into memory of an application specific integrated circuit.

29. (original) An in-line particulate detector in accordance with Claim 27, wherein said control structure is inputted into said circuitry by being embedded in the form of algorithms in one or more computers.

30. (original) An in-line particulate detector in accordance with Claim 29, wherein said computer is selected from the group consisting of a workstation, a minicomputer, a microcomputer, and a supercomputer.

31. (original) An in-line particulate detector in accordance with Claim 27, wherein said control structure is programmed in a language selected from the group of C, C++, Basic, MATLAB, and FORTRAN.

32-36. (canceled)

37. (currently amended) An in-line particulate detector comprising:

a housing having an inner flow portion in flow communication with a fluid inlet and a fluid outlet; which housing is installed in-line between adjacent portions of a pipeline in a system and is removably disposable between the adjacent portions of the pipeline to permit a fuel flow from a fuel source through said inner flow portion to a fuel consumer;

a laser diode light source disposed within said housing for emitting a light beam within said inner flow portion;

a first photodiode disposed within said housing positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode;

a second photodiode disposed within said housing adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode such that a baseline level of an unimpeded generated light beam is detected by said second photodiode;

circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced flow; and

a control structure inputted into said circuitry to initiate a system control based on the ratio of light intensities.

38. (currently amended) An in-line particulate detector for insertion within a pipeline, said detector comprising:

a laser diode light source to be disposed within said pipeline for emitting a light beam within an inner flow portion of said pipeline, the inner flow portion in flow communication with a fluid inlet and a fluid outlet;

a first photodiode to be disposed within said pipeline positioned opposite and substantially normal to said laser diode light source such that substantially full strength of an unimpeded generated light beam is detected by said first photodiode;

a second photodiode to be disposed within said pipeline adjacent said first photodiode and offset from a normal unimpeded path between said laser diode and said first photodiode such that a baseline level of unimpeded generated light beam is detected by said second photodiode;

circuitry coupled to said first and second photodiode to monitor the ratio of light intensities measured by said first and second photodiodes to indicate the presence of particulate within an introduced flow; and